



An annotated checklist of the Tortricidae of the region of Murcia (Spain) with new records, distribution and biological data (Lepidoptera, Tortricoidea)

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Abstract

Background

The Murcia Region is located at the south-east corner of the Iberian Peninsula and has a great diversity of Lepidoptera fauna, as a zoogeographical crossroads and biodiversity hotspot with almost 1,100 butterflies and moth species recorded. The study of its Microlepidoptera fauna has already been initiated previously for the families Crambidae and Pyralidae into the clade Obtectometra.

New information

This document presents a detailed and critical catalogue of Tortricidae moths (Lepidoptera, Tortricoidea) from the Murcia Region, derived from an analysis of museum specimens as well as both published and new observations. A total of two subfamilies (Tortricinae and Olethreutinae), 52 genera and 107 species have been identified and are

provided here, complete with their collection details, references in literature and biological information. This includes chorotype, voltinism, larval feeding behaviour and the flight periods observed within the study area. Amongst these, seventy-four species are recorded for the first time, twenty-six species are corroborated from existing literature and merely seven species have yet to be seen in the Murcia Region.

Keywords

Lepidoptera, Tortricidae, checklist, chorology, distribution, new records, phenology, feeding patterns, Iberian Peninsula

Introduction

The Tortricidae, belonging to the superfamily Tortricoidea, are mostly nocturnal micromoths (Microlepidoptera) with an estimated 10,300 named species worldwide, of which the European fauna is represented by ca. 1,100 species (Gilligan et al. 2018) and 527 in the Iberian Peninsula (Redondo et al. 2020). The three main evolutionary lineages within Tortricidae are Tortricinae, Chlidanotinae and Olethreutinae and they are monophyletically characterised by head rough-scaled above; scaling of lower frons short, appressed and upwardly directed; proboscis well developed and unscaled; labial palpi three-segmented and generally held horizontally or porrect, with apical segment short and blunt; maxillary palpi reduced; ocelli and chaetosema present; ovipositor lobes flat. The structure of the female ovipositor is the only single apomorphy that unites the entire family (Horak and Brown 1991).

The Tortricidae of the Iberian Peninsula are poorly recorded and more precise data are necessary for the production of distribution maps since only Aragon (Redondo et al. 2020), Catalonia (Ylla et al. 2011) and Portugal (Corley 2015) have their own catalogues used to update Iberian Lepidoptera catalogue from Vives-Moreno (2014) along with other more specific contributions on species (see in Redondo et al. (2020)).

Historically, the first tortricid moths recorded and described from Murcia Region in Kennel (1901) were *Euxanthia bigenerara* Kennel, 1901, currently considered synonymous with *Cochylimorpha cultana* (Lederer, 1855); *Euxanthia lentiginosana* Kennel, 1901, currently considered synonymous with *Cochylimorpha straminea* (Haworth, 1811); *Cochylis incommodana* Kennel, 1901, currently considered synonymous with *Aethes languidana* (Mann, 1855); and *Grapholita bipartitana* Kennel, 1901 and *G. dimidiatana* Kennel, 1901, both currently considered synonymous with *Grapholita lunulana* (Denis & Schiffermüller, 1775). Subsequently, Alvarez (1907) cited *Aethes perfidana* (Kennel, 1901), Caradja (1916) recorded without specifying the location of *Phtheochroa rugosana* (Hübner, 1799), *Pelochrista fusculana* (Zeller, 1847), *Aethes margarotana* (Duponchel, 1836), *Xerocnephasia rigana* (Sodoffsky, 1829) and *Thiodia trochilana* (Frölich, 1828) and Kennel (1919) described *Agapeta angelana* (Kennel, 1919) from Murcia. From the 1920s onwards, Rebel and Zerny (1927) described *Phtheochroa cymatodana* (Rebel, 1927)

from Sierra Espuña repeatedly re-described as *Phalonia hermosa* by Schmidt (1934) and subsequently synonymised. Schmidt (1934) also described *Paramesia alhamana* (Schmidt, 1934) from the same locality, while Hering (1935) recorded *Selania leplastriana* (Curtis, 1831) like *Laspeyresia vana* Kennel, 1901 from Totana and Domínguez (1943) and Ruiz-Castro (1943) mentioned several species with phytosanitary interest, such as *Acleris variegana* (Denis & Schiffermüller, 1775), *Cydia pomonella* (Linnaeus, 1758), *Sparganothis pilleriana* (Denis & Schiffermüller, 1775) and *Lobesia botrana* (Denis & Schiffermüller, 1775).

Later, in the second half of the 20th century, Razowski (1970) recorded *Agapeta angelana* (Kennel, 1919), *Phtheochroa cymatodana* (Rebel, 1927), *Aethes flagellana* (Duponchel, 1836) and *Aethes tornella* (Walsingham, 1898), while *Aethes bilbaensis* (Rössler, 1877) was cited by Agenjo (1973), *Avaria hyerana* (Millière, 1858) by Agenjo (1976), *Pseudococcyx tessulatana* (Staudinger, 1871) by Templado (1976) and *Grapholita molesta* (Busck, 1916) by Garrido et al. (1979). In the 80s, Derra and Hacker (1982) recorded *Aethes moribundana* (Staudinger, 1859), *A. margarotana* (Duponchel, 1836) and *A. flagellana* (Duponchel, 1836); Derra (1989) cited *Phtheochroa syrtana* Ragonot, 1888 and *Phtheochroa ochrobasana* (Chrétien, 1915); and Baixeras and Domínguez (1993) recorded *Paramesia alhamana* (Schmidt, 1933).

In the 21st century, Razowski (2003) and Razowski (2009) referenced *Cydia gilviciliana* (Staudinger, 1859) and *Agapeta angelana* (Kennel, 1919), respectively and Larsen (2010) described *Clavigesta gerti* Larsen, 2010 from Sierra Espuña amongst other Iberian localities. The last known was the invasive and polyphagous tortricid *Platynota stultana* Walsingham, 1884, economically important species native from Mexico and the south-western United States (Hymenoptera 2011, Groenen and Baixeras 2013). Particularly noteworthy is the recent description of *Eucosma callei* Girdley, Garre, Rubio & Ortiz, 2025 from the northwest of Murcia Region (Girdley et al. 2025).

The summary for the ecophysiological characterisation of the study area (south-eastern Iberian Peninsula) can be consulted in Garre et al. (2021). Considering various bioclimatic approaches relative to temperature (thermotypes) and rainfall (ombrotypes), four different bioclimatic belts can be recognised according to Alcaraz-Ariza et al. (2008): thermo-, meso-, supra- and oromediterranean (Fig. 1).

The study of the Tortricidae family of the Region of Murcia is a continuation of those initiated for the families Crambidae (Garre et al. 2021) and Pyralidae (Garre et al. 2022) and the present checklist is intended to update the recorded species and to facilitate access to the most recent data about distribution, chorology, phenology and voltinism.

Materials and methods

The list contains all species of Tortricidae collected by the authors along with the material deposited in the private collections of J.A. de la Calle, F. Lencina, F. Albert and F. Arcas. The study was carried out from 1978 to 2024 distributed in 424 samples taken in 57

locations belonging to 17 municipalities in the Region of Murcia (Fig. 2). It also includes all of those records previously referenced in the bibliography.

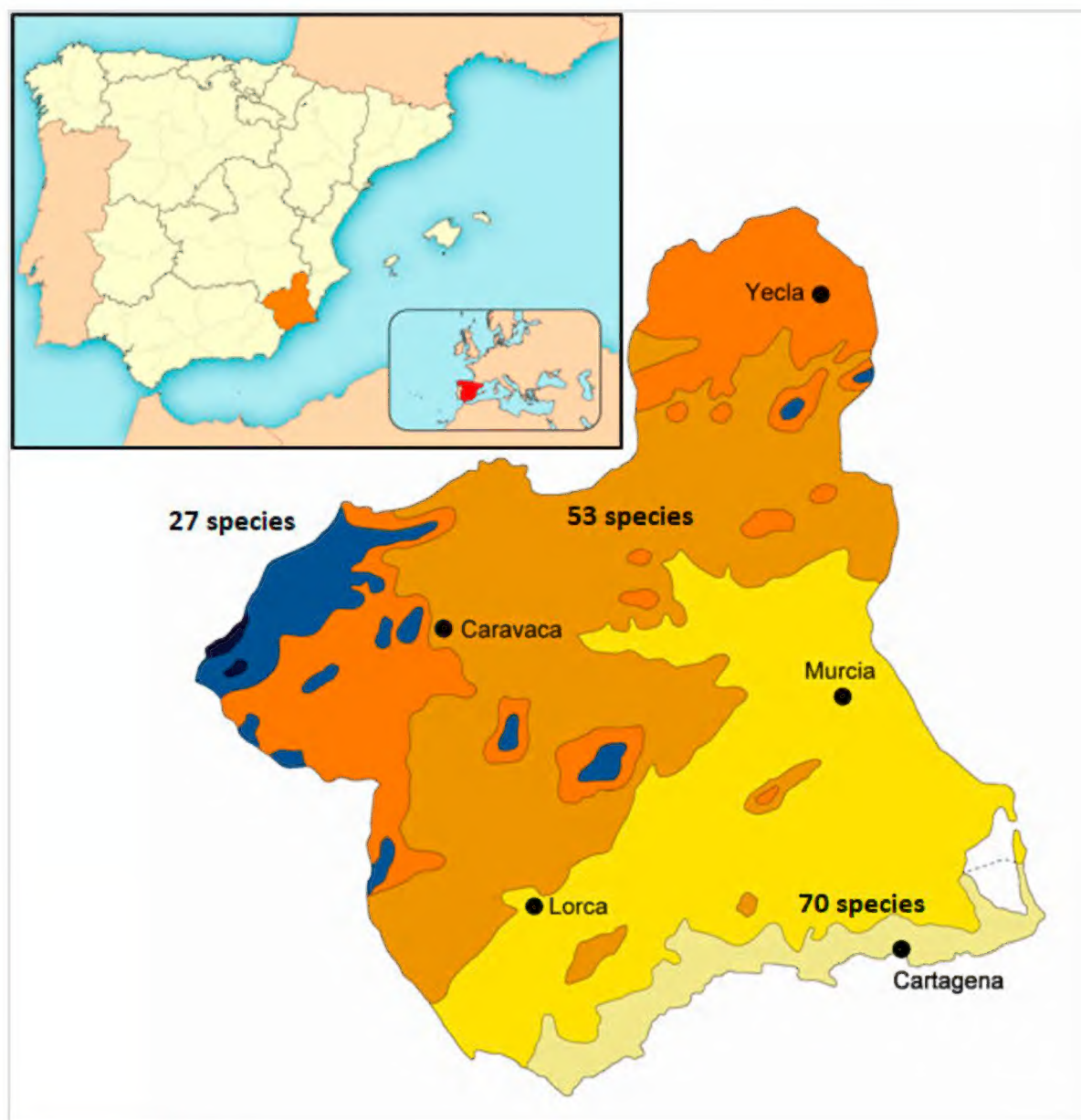


Figure 1. [doi](#)

Map of the known species diversity in the bioclimatic areas in the Murcia Region. Black and blue: Oro- and Supramediterranean (27 spp.); orange and light brown: Cold and mild Mesomediterranean (53 spp.); Yellow and light green: Upper and lower Thermomediterranean (70 spp.).

Black and actinic (6 and 15 W) Heath traps, 125 W Robinson traps, 125 W mercury vapour traps and 4 W LED light traps were used for nocturnal sampling. Catches taken in the urban environment (street lighting) are also included. All these sampling points are located within the study area and cover protected areas like the mountainous Regional Parks of Sierra Espuña and Sierra de la Pila, the coastal Regional Parks of Calblanque, Monte de las Cenizas y Peña del Águila and Salinas y Arenales de San Pedro del Pinatar, Humedal del Ajauque y Rambla Salada, Saladares del Guadalentín and Revolcadores, as well as other natural areas without special protection including agricultural landscapes and urban environments.

All studied specimens are deposited in the entomological collection in the Zoology Department of Murcia University (Spain) and in the collections of Francisco Lencina,

Fernando Albert and Francisco Arcas. The occurrence data can be accessed at GBIF by <https://doi.org/10.15470/lo5ekw>

Notes on the checklist

The subfamilies are systematically ordered and identified, based on the classification of Tortricidae by Gilligan et al. (2018). The genera and species are listed under their subfamilies and tribes and are also ordered systematically, together with collection data (sampling localities, altitude, decimal coordinates, date and number of specimens). In addition, for each species, related references and biological data are provided, including general chorotypes, feeding patterns of larvae, voltinism based on literature and the flight period in the study area or nearby areas indicated by months in Roman numerals.

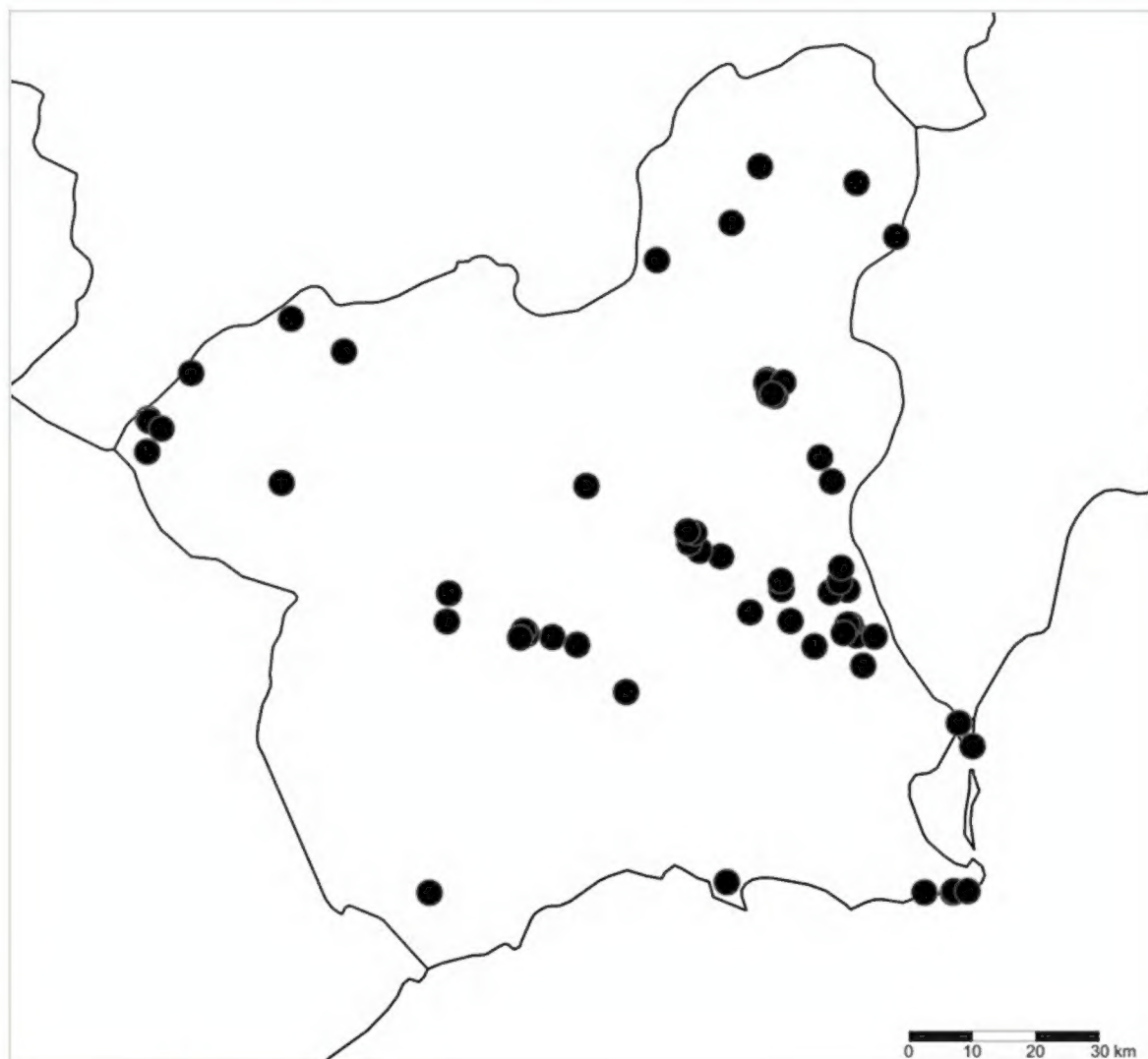


Figure 2. [doi](https://doi.org/10.15470/lo5ekw)

Map of the distribution of the localities sampled in the Murcia Region.

Baixeras-Almela (1987), Razowski (2002), Razowski (2003), Razowski (2008), Razowski (2009) and Leraut (2023) were consulted to obtain the information on biology, voltinism and geographical distribution of the species, while Yela (1992) was consulted for biogeographic criteria. The Tortricidae of the Murcia Region are ordered into two subfamilies, Tortricinae and Olethreutinae and 13 tribes: Cochylini, Tortricini, Cnephasiini, Sparganothini, Archipini, Olethreutini, Eucosmini, Enarmoniini and Grapholitini (Gilligan et al. 2018).

Annotated checklist of Tortricidae recorded in the Murcia Region

Family Tortricidae

Subfamily Tortricinae

Tribe Cochylini

***Phtheochroa cymatodana* (Rebel, 1927)**

Distribution: Atlanto-Mediterranean

Notes: References: Rebel and Zerny (1927); Schmidt (1934) as *Phalonia hermosa* Schmidt, 1934; Razowski (1970). Biological data: Univoltine. Flight period: V. Feeding patterns: Unknown.

***Phtheochroa ochrobasana* (Chrétien, 1915)**

Distribution: Atlanto-Mediterranean

Notes: References: Derra (1989). Biological data: Univoltine. Flight period: IX-X. Feeding patterns: Unknown.

***Phtheochroa syrtana* (Ragonot, 1888)**

Distribution: Mediterranean-Asiatic

Notes: References: Derra (1989). Biological data: Univoltine. Flight period: VIII-XI. Feeding patterns: Monophagous.

***Phtheochroa rugosana* (Hübner, 1799)**

Distribution: Mediterranean-Asiatic

Notes: References: Caradja (1916). Biological data: Univoltine with imagoes with a winter diapause. Flight period: II, IV-VI, IX-XI. Feeding patterns: Oligophagous.

***Hysterophora maculosana* (Haworth, 1811)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Univoltine. Flight period: IV. Feeding patterns: Oligophagous. First record in Murcia Region.

***Cochylimorpha agenjoi* (Razowski, 1963)**

Distribution: Endemic

Notes: Biological data: Univoltine. Flight period: X. Feeding patterns: Unknown. First record in Murcia Region.

***Cochylimorpha cultana* (Lederer, 1855)**

Distribution: Eurasiatic

Notes: References: Kennel (1901) as *Euxanthia bigenerara* Kennel, 1901. Biological data: Univoltine. Flight period: I-VI. Feeding patterns: Monophagous.

***Cochylimorpha elongana* (Fischer von Röslerstamm, 1839)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: III-IV, IX-X. Feeding patterns: Oligophagous. First record in Murcia Region.

***Cochylimorpha meridiana* (Staudinger, 1859)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: VII-VIII. Feeding patterns: Monophagous. First record in Murcia Region.

***Cochylimorpha decolorella* (Zeller, 1839)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Univoltine. Flight period: II-III. Feeding patterns: Monophagous. First record in Murcia Region.

***Cochylimorpha straminea* (Haworth, 1811)**

Distribution: Eurasiatic

Notes: References: Kennel (1901) as *Euxanthia lentiginosana* Kennel, 1901. Biological data: Bivoltine. Flight period: IV-VI, X-II. Feeding patterns: Monophagous.

***Cochylimorpha salinarida* Groenen & Larsen, 2003**

Distribution: Endemic

Notes: Biological data: Univoltine. Flight period: IX-X. Feeding patterns: Unknown. First record in Murcia Region.

***Phalonidia albipalpana* (Zeller, 1847)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: III-IV, VII-IX. Feeding patterns: Monophagous. First record in Murcia Region.

***Phalonidia contractana* (Zeller, 1847)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: V-VI, VIII-X. Feeding patterns: Oligophagous. First record in Murcia Region.

***Agapeta angelana* (Kennel, 1919)**

Distribution: Atlanto-Mediterranean

Notes: References: Kennel (1919), Razowski (1970), Razowski (2009). Biological data: Bivoltine. Flight period: V-VII. Feeding patterns: Unknown.

***Eugnosta lathoniana* (Hübner, 1800)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: VI, VIII-IX. Feeding patterns: Monophagous. First record in Murcia Region.

***Aethes williana* (Brahm, 1791)**

Distribution: Eurasiatic

Notes: Biological data: Polyvoltine. Flight period: VIII-X. Feeding patterns: Polyphagous. First record in Murcia Region.

***Aethes margarotana* (Duponchel, 1836)**

Distribution: Eurasiatic

Notes: References: Caradja (1916), Derra and Hacker (1982). Biological data: Bivoltine. Flight period: III, VI-VII. Feeding patterns: Oligophagous.

***Aethes moribundana* (Staudinger, 1859)**

Distribution: Eurasiatic

Notes: References: Derra and Hacker (1982). Biological data: Bivoltine. Flight period: VI. Feeding patterns: Monophagous.

***Aethes languidana* (Mann, 1855)**

Distribution: Atlanto-Mediterranean

Notes: References: Kennel (1901) as *Cochylis incommodana* Kennel, 1901.
Biological data: Bivoltine. Flight period: II-IV, X. Feeding patterns: Monophagous.

***Aethes flagellana* (Duponchel, 1836)**

Distribution: Eurasiatic

Notes: References: Razowski (1970), Derra and Hacker (1982). Biological data: Univoltine. Flight period: VI. Feeding patterns: Monophagous.

***Aethes francillana* (Fabricius, 1794)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: IV-VIII. Feeding patterns: Oligophagous. First record in Murcia Region.

***Aethes bilbaensis* (Rössler, 1877)**

Distribution: Eurasiatic

Notes: References: Agenjo (1973). Biological data: Bivoltine. Flight period: VIII, X. Feeding patterns: Oligophagous.

***Aethes tornella* (Walsingham, 1898)**

Distribution: Eurasiatic

Notes: References: Razowski (1970). Biological data: Bivoltine. Feeding patterns: Unknown.

***Aethes scalana* (Zerny, 1927)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Univoltine. Flight period: VIII-IX. Feeding patterns: Unknown. First record in Murcia Region.

***Aethes perfidana* (Kennel, 1901)**

Distribution: Endemic

Notes: References: Alvarez (1907). Biological data: Univoltine. Feeding patterns: Unknown.

***Aethes kindermanniana* (Treitschke, 1830)**

Distribution: Holarctic

Notes: Biological data: Bivoltine. Flight period: VIII. Feeding patterns: Oligophagous. First record in Murcia Region.

***Cochylidia heydeniana* (Herrich-Schäffer, 1851)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: X. Feeding patterns: Oligophagous. First record in Murcia Region.

***Diceratura infantana* (Kennel, 1899)**

Distribution: Atlanto-Mediterranean

Notes: References: Razowski (1970). Biological data: Bivoltine. Flight period: VI. Feeding patterns: Unknown.

***Longicornutia epilana* (Duponchel, 1843)**

Distribution: Eurasiatic

Notes: References: Razowski (1970). Biological data: Bivoltine. Flight period: II, IV-VI. Feeding patterns: Monophagous.

***Neocochylis molliculana* (Zeller, 1847)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: IV-VIII. Feeding patterns: Monophagous. First record in Murcia Region.

***Pontoturania posterana* (Zeller, 1847)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: V-VII. Feeding patterns: Oligophagous. First record in Murcia Region.

Tribe Tortricini***Tortrix viridana* Linnaeus, 1758**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: VI. Feeding patterns: Monophagous. First record in Murcia Region.

***Aleimma loeflingiana* (Linnaeus, 1758)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: VI. Feeding patterns: Oligophagous. First record in Murcia Region.

***Acleris variegana* (Denis & Schiffermüller, 1775)**

Distribution: Holarctic

Notes: References: Domínguez (1943). Biological data: Univoltine with imagoes with a winter diapause. Flight period: VII-X, V. Feeding patterns: Polyphagous.

Tribe Cnephasiini

***Xerocnephasia rigana* (Sodoffsky, 1829)**

Distribution: Palaearctic

Notes: References: Caradja (1916). Biological data: Bivoltine. Feeding patterns: Oligophagous.

***Oxypteron schawerdai* (Rebel, 1936)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Univoltine. Flight period: IX-XI. Feeding patterns: Unknown. First record in Murcia Region.

***Eana nevadensis* (Rebel, 1929)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Univoltine. Flight period: VI-VII. Feeding patterns: Unknown. First record in Murcia Region.

***Cnephasia pasiutana* (Hübner, 1799)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: V. Feeding patterns: Polyphagous. First record in Murcia Region.

***Cnephasia alfacarana* Razowski, 1958**

Distribution: Endemic

Notes: Biological data: Univoltine. Flight period: V-VI. Feeding patterns: Unknown. First record in Murcia Region.

***Cnephasia fulturata* Rebel, 1940**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Univoltine. Flight period: V. Feeding patterns: Unknown. First record in Murcia Region.

***Cnephasia sedana* (Constant, 1884)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: V. Feeding patterns: Polyphagous. First record in Murcia Region.

Tribe Sparganothini***Sparganothis pilleriana* (Denis & Schiffermüller, 1775)**

Distribution: Holarctic

Notes: References: Ruiz-Castro (1943). Biological data: Univoltine. Feeding patterns: Polyphagous.

***Platynota stultana* (Walsingham, 1884)**

Distribution: Holarctic

Notes: References: Hymenoptera (2011). Biological data: Polyvoltine. Flight period: III-X. Feeding patterns: Polyphagous.

Tribe Archipini***Ditula joannisiana* (Ragonot, 1889)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Univoltine. Flight period: X. Feeding patterns: Polyphagous. First record in Murcia Region.

***Paramesia alhamana* (Schmidt, 1934)**

Distribution: Endemic

Notes: References: Schmidt (1934), Baixeras and Domínguez (1993). Biological data: Univoltine. Flight period: IV-V. Feeding patterns: Unknown.

***Avaria hyerana* (Millière, 1858)**

Distribution: Mediterranean-Asiatic

Notes: References: Agenjo (1976) as *Hastula lithosiana* Kennel, 1889. Biological data: Univoltine. Flight period: X. Feeding patterns: Monophagous.

***Pandemis heparana* (Denis & Schiffermüller, 1775)**

Distribution: Holarctic

Notes: Biological data: Bivoltine. Flight period: IX. Feeding patterns: Polyphagous. First record in Murcia Region.

***Lozotaenia cupidinana* (Staudinger, 1859)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Bivoltine. Flight period: II-VII, IX-X. Feeding patterns: Polyphagous. First record in Murcia Region.

***Cacoecimorpha pronubana* (Hübner, 1799)**

Distribution: Cosmopolitan

Notes: Biological data: Bivoltine. Flight period: IV-VIII, X. Feeding patterns: Polyphagous. First record in Murcia Region.

***Clepsis unicolorana* (Duponchel, 1835)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Univoltine. Flight period: III-IV. Feeding patterns: Monophagous. First record in Murcia Region.

***Clepsis eatoniana* (Ragonot, 1881)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Bivoltine. Flight period: II-VI, IX-X. Feeding patterns: Unknown. First record in Murcia Region.

***Clepsis siciliana* (Ragonot, 1894)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Bivoltine. Flight period: II, IV-X. Feeding patterns: Unknown. First record in Murcia Region.

***Lozotaeniodes cupressana* (Duponchel, 1836)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: X. Feeding patterns: Oligophagous. First record in Murcia Region.

Tribe Olethreutini***Bactra lancealana* (Hübner, 1799)**

Distribution: Cosmopolitan

Notes: Biological data: Bivoltine. Flight period: IV-V. Feeding patterns: Polyphagous. First record in Murcia Region.

***Bactra venosana* (Zeller, 1847)**

Distribution: Cosmopolitan

Notes: Biological data: Bivoltine. Flight period: IV, VII-X. Feeding patterns: Monophagous. First record in Murcia Region.

***Bactra bactrana* (Kennel, 1901)**

Distribution: Cosmopolitan

Notes: Biological data: Polyvoltine. Flight period: III-V, VII-X. Feeding patterns: Polyphagous. First record in Murcia Region.

***Bactra simpliciana* Chrétien, 1915**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: V. Feeding patterns: Monophagous. First record in Murcia Region.

***Endothenia oblongana* (Haworth, 1811)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: V-VII, X. Feeding patterns: Polyphagous. First record in Murcia Region.

***Endothenia marginana* (Haworth, 1811)**

Distribution: Palaearctic

Notes: Biological data: Bivoltine. Flight period: V-VIII. Feeding patterns: Polyphagous. First record in Murcia Region.

***Endothenia pauperkulana* (Staudinger, 1859)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Bivoltine. Flight period: II, IV-V. Feeding patterns: Oligophagous. First record in Murcia Region.

***Hedya nubiferana* (Haworth, 1811)**

Distribution: Holarctic

Notes: Biological data: Univoltine. Flight period: VI. Feeding patterns: Polyphagous. First record in Murcia Region.

***Piniphila bifasciana* (Haworth, 1811)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: VI. Feeding patterns: Monophagous. First record in Murcia Region.

***Lobesia botrana* (Denis & Schiffermüller, 1775)**

Distribution: Cosmopolitan

Notes: References: Ruiz-Castro (1943). Biological data: Polyvoltine. Flight period: II-VI, VIII. Feeding patterns: Polyphagous.

***Lobesia indusiana* (Zeller, 1847)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: IV-VI, IX-X. Feeding patterns: Oligophagous. First record in Murcia Region.

***Lobesia limoniana* (Millière, 1860)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Bivoltine. Flight period: II-V. Feeding patterns: Monophagous. First record in Murcia Region.

Tribe Eucosmini***Thiodia trochilana* (Frölich, 1828)**

Distribution: Mediterranean-Asiatic

Notes: References: Caradja (1916) as *Steganoptycha delitana* Fisher von Röslerstamm, 1839. Biological data: Bivoltine. Flight period: III-X. Feeding patterns: Monophagous.

***Thiodia couleruana* (Duponchel, 1835)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Univoltine. Flight period: IV-V, VIII. Feeding patterns: Monophagous. First record in Murcia Region.

***Acroclita subsequana* (Herrich-Schäffer, 1851)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Bivoltine. Flight period: II, V, X. Feeding patterns: Monophagous. First record in Murcia Region.

***Epinotia thapsiana* (Zeller, 1847)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: IV-VI, VIII. Feeding patterns: Oligophagous. First record in Murcia Region.

***Epinotia dalmatana* (Rebel, 1891)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Univoltine. Flight period: V-VI. Feeding patterns: Monophagous. First record in Murcia Region.

***Zeiraphera griseana* (Hübner, 1799)**

Distribution: Holarctic

Notes: Biological data: Univoltine. Flight period: VIII. Feeding patterns: Oligophagous. First record in Murcia Region.

***Crociosema plebejana* Zeller, 1847**

Distribution: Cosmopolitan

Notes: Biological data: Polyvoltine. Flight period: II-X. Feeding patterns: Oligophagous. First record in Murcia Region.

***Pelochrista fusculana* (Zeller, 1847)**

Distribution: Mediterranean-Asiatic

Notes: References: Caradja (1916). Biological data: Univoltine. Feeding patterns: Unknown.

***Pelochrista mollitana* (Zeller, 1847)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: VI. Feeding patterns: Monophagous. First record in Murcia Region.

***Pelochrista infidana* (Hübner, 1824)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: VIII-IX. Feeding patterns: Monophagous. First record in Murcia Region.

***Eucosma cumulana* (Guenée, 1845)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Univoltine. Flight period: IV. Feeding patterns: Monophagous. First record in Murcia Region.

***Eucosma gonzalezalvarezi* Agenjo, 1970**

Distribution: Endemic

Notes: Biological data: Univoltine. Flight period: X. Feeding patterns: Monophagous. First record in Murcia Region.

***Eucosma callei* Girdley, Garre, Rubio & Ortiz, 2025**

Distribution: Endemic

Notes: References: Girdley et al. (2025). Biological data: Univoltine. Flight period: IX. Feeding patterns: Unknown.

***Gypsonoma minutana* (Hübner, 1799)**

Distribution: Palaearctic

Notes: Biological data: Univoltine. Flight period: VII-VIII. Feeding patterns: Oligophagous. First record in Murcia Region.

***Epiblema scutulana* (Denis & Schiffermüller, 1775)**

Distribution: Palaearctic

Notes: Biological data: Univoltine. Flight period: V. Feeding patterns: Oligophagous. First record in Murcia Region.

***Notocelia cynosbatella* (Linnaeus, 1758)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: V. Feeding patterns: Polyphagous. First record in Murcia Region.

***Notocelia incarnatana* (Hübner, 1800)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: IX. Feeding patterns: Monophagous. First record in Murcia Region.

***Pseudococcyx tessulatana* (Staudinger, 1871)**

Distribution: Mediterranean-Asiatic

Notes: References: Templado (1976). Biological data: Bivoltine. Flight period: II-VIII. Feeding patterns: Oligophagous.

***Clavigesta gerti* Larsen, 2010**

Distribution: Atlanto-Mediterranean

Notes: References: Larsen (2010). Biological data: Polyvoltine. Flight period: VII-X. Feeding patterns: Monophagous.

***Rhyacionia buoliana* (Denis & Schiffermüller, 1775)**

Distribution: Cosmopolitan

Notes: Biological data: Univoltine. Flight period: V-VIII. Feeding patterns: Monophagous. First record in Murcia Region.

***Rhyacionia pinicolana* (Doubleday, 1850)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: VIII. Feeding patterns: Monophagous. First record in Murcia Region.

***Rhyacionia maritimana* Pröse, 1981**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Univoltine. Flight period: IV-VI. Feeding patterns: Unknown. First record in Murcia Region.

***Rhyacionia pinivorana* (Lienig & Zeller, 1846)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: VI. Feeding patterns: Monophagous. First record in Murcia Region.

Tribe Enarmoniini***Ancylis sparulana* (Staudinger , 1859)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Polyvoltine. Flight period: II-VIII, X. Feeding patterns: Monophagous. First record in Murcia Region.

Tribe Grapholitini***Grapholita lunulana* (Denis & Schiffermüller, 1775)**

Distribution: Eurasiatic

Notes: References: Kennel (1901) as *G. bipartitana* Kennel, 1901 and *G. dimidiatana* Kennel, 1901. Biological data: Univoltine. Feeding patterns: Oligophagous.

***Grapholita molesta* (Busck in Quaintance & Wood, 1916)**

Distribution: Cosmopolitan

Notes: References: Garrido et al. (1979). Biological data: Polyvoltine. Flight period: VI, IX. Feeding patterns: Polyphagous.

***Cydia gilviciliana* (Staudinger, 1859)**

Distribution: Atlanto-Mediterranean

Notes: References: Razowski (2003). Biological data: Univoltine. Feeding patterns: Unknown.

***Cydia ulicetana* (Haworth, 1811)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: IV-VI. Feeding patterns: Oligophagous. First record in Murcia Region.

***Cydia ilipulana* (Walsingham, 1903)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: IV-VI, IX-X. Feeding patterns: Monophagous. First record in Murcia Region.

***Cydia vallesiaca* (Sauter, 1968)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Univoltine. Flight period: III-VII. Feeding patterns: Monophagous. First record in Murcia Region.

***Cydia adenocarpi* (Ragonot, 1875)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Bivoltine. Flight period: V-VI. Feeding patterns: Monophagous. First record in Murcia Region.

***Cydia conicolana* (Heylaerts, 1874)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Univoltine. Flight period: VI. Feeding patterns: Monophagous. First record in Murcia Region.

***Cydia coniferana* (Saxesen, 1840)**

Distribution: Holarctic

Notes: Biological data: Bivoltine. Flight period: VI, IX. Feeding patterns: Oligophagous. First record in Murcia Region.

***Cydia pomonella* (Linnaeus, 1758)**

Distribution: Cosmopolitan

Notes: References: Domínguez (1943). Biological data: Bivoltine. Flight period: V-IX. Feeding patterns: Oligophagous.

***Cydia splendana* (Hübner, 1799)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: X. Feeding patterns: Oligophagous. First record in Murcia Region.

***Cydia fagiglandana* (Zeller, 1841)**

Distribution: Eurasiatic

Notes: Biological data: Bivoltine. Flight period: VI-X. Feeding patterns: Oligophagous. First record in Murcia Region.

***Cydia amplana* (Hübner, 1799)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: VIII-X. Feeding patterns: Polyphagous. First record in Murcia Region.

***Selania leplastriana* (Curtis, 1831)**

Distribution: Eurasiatic

Notes: References: Hering (1935) as *Laspeyresia vana* Kennel, 1901. Biological data: Polyvoltine. Flight period: III-VIII, X-XI. Feeding patterns: Oligophagous.

***Selania resedana* (Obraztsov, 1959)**

Distribution: Atlanto-Mediterranean

Notes: Biological data: Bivoltine. Flight period: V-VI. Feeding patterns: Monophagous. First record in Murcia Region.

***Selania capparidana* (Zeller, 1847)**

Distribution: Mediterranean-Asiatic

Notes: Biological data: Polyvoltine. Flight period: V. Feeding patterns: Monophagous. First record in Murcia Region.

***Pammene fasciana* (Linnaeus, 1761)**

Distribution: Eurasiatic

Notes: Biological data: Univoltine. Flight period: VI. Feeding patterns: Oligophagous. First record in Murcia Region.

Analysis

The list includes 107 species in 52 genera and two subfamilies: Tortricinae (54 species) and Olethreutinae (53 species). Seventy-four new records (69.2%) from the Murcia Region are added to its Lepidopteran fauna. The number of species known from this territory, at this time, accounts for 9.7% of the European (1,100) and 20.3% of the Iberian species (527).

The most species-rich subfamily, Tortricinae, comprises 55.8% of all genera and 50.5% of all species, while Olethreutinae comprises 44.2% and 49.5%, respectively (Table 1).

Table 1.
Numbers and percentages of known genera and species recorded for each subfamily in Murcia Region.

| Subfamilies | Genus richness | % Genus | Species richness | % Species |
|---------------|----------------|---------|------------------|-----------|
| Tortricinae | 29 | 55.8 | 54 | 50.5 |
| Olethreutinae | 23 | 44.2 | 53 | 49.5 |
| Total | 52 | 100 | 107 | 100 |

Known Tortricidae diversity in the Murcia Region seems still relatively poor when compared to those in other Iberian Regions and with the whole of the Iberian Peninsula, as, for instance, the only three Iberian regions extensively surveyed like Catalonia (346 species; Ylla et al. (2019)), Aragon (320 species; Redondo et al. (2020)) and the whole of Portugal (235 species; Corley (2015)). However, increasing the sampling effort will allow adding new species to the checklist of the Tortricidae of the Murcia Region.

The most species-rich Tortricidae genera in the Murcia Region are *Aethes* and *Cydia* (11 species, 10.3% each, respectively), *Cochylimorpha* (7 species, 6.5%) and *Phtheochroa*, *Cnephasia*, *Bactra* and *Rhyacionia* (4 species, 3.7% each, respectively). On the other

hand, eleven of the studied genera are species-poor (2-3 species) and 34 genera are single species.

Species richness varies substantially amongst the different bioclimatic belts of the Murcia Region (Fig. 1). The Thermomediterranean belt has the most diverse Tortricidae fauna with 70 species recorded, followed by the Mesomediterranean belt with 53 species, while the Supra- and Oromediterranean areas appear to be less diverse with 27 species (Table 2). In each of these belts, 34 species are unique in the Thermo-, 16 in Meso- and nine in Supra and Oromediterranean belts, while 32 species were recorded in two belts and nine in all studied belts. Thus, according with these data, excluding the seven species known only from bibliographic references (*Aethes tornella*, *A. perfidana*, *Xerocnephasia rigana*, *Sparganothis pilleriana*, *Pelochrista fusculana*, *Cydia gilviciliana* and *Grapholita lunulana*), 55.1% of the species can be considered specialists in a given bioclimatic belt, while the other 44.9% can be considered as opportunists of different types of vegetation that characterise each of the bioclimatic belts. The detailed data for the bioclimatic belts of Tortricidae in the Murcia Region are summarised in Table 2.

Table 2.
List of unique species in each bioclimatic area or in more than one bioclimatic area.

| | |
|-----------------------------|--|
| Oro- and Supramediterranean | <i>Aethes moribundana</i> (Staudinger, 1859) |
| | <i>Aethes flagellana</i> (Duponchel, 1836) |
| | <i>Pontoturania posterana</i> (Zeller, 1847) |
| | <i>Eana nevadensis</i> (Rebel, 1929) |
| | <i>Piniphila bifasciana</i> (Haworth, 1811) |
| | <i>Epiblema scutulana</i> (Denis & Schiffermüller, 1775) |
| | <i>Rhyacionia pinicolana</i> (Doubleday, 1850) |
| | <i>Rhyacionia pinivorana</i> (Lienig & Zeller, 1846) |
| | <i>Cydia conicolana</i> (Heylaerts, 1874) |
| | |
| Mesomediterranean | <i>Phtheochroa cymatodana</i> (Rebel, 1927) |
| | <i>Agapeta angelana</i> (Kennel, 1919) |
| | <i>Aethes scalana</i> (Zerny, 1927) |
| | <i>Aethes kindermanniana</i> (Treitschke, 1830) |
| | <i>Diceratura infantana</i> (Kennel, 1899) |
| | <i>Aleimma loeflingiana</i> (Linnaeus, 1758) |
| | <i>Cnephasia pasiuana</i> (Hübner, 1799) |
| | <i>Cnephasia fulturata</i> Rebel, 1940 |
| | <i>Ditula joannisiana</i> (Ragonot, 1889) |
| | <i>Paramesia alhamana</i> (Schmidt, 1934) |
| | <i>Pandemis heparana</i> (Denis & Schiffermüller, 1775) |
| | <i>Hedya nubiferana</i> (Haworth, 1811) |
| | |

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|---------------------|---|
| | <i>Eucosma callei</i> Girdley, Garre, Rubio & Ortiz, 2025 |
| | <i>Notocelia cynosbatella</i> (Linnaeus, 1758) |
| | <i>Notocelia incarnatana</i> (Hübner, 1800) |
| | <i>Cydia splendana</i> (Hübner, 1799) |
| Thermomediterranean | <i>Phtheochroa rugosana</i> (Hübner, 1799) |
| | <i>Hysterothrips maculosana</i> (Haworth, 1811) |
| | <i>Cochylimorpha agenjoi</i> (Razowski, 1963) |
| | <i>Cochylimorpha elongana</i> (Fischer von Röslerstamm, 1839) |
| | <i>Cochylimorpha salinarida</i> Groenen & Larsen, 2003 |
| | <i>Phalonidia albipalpana</i> (Zeller, 1847) |
| | <i>Aethes williana</i> (Brahm, 1791) |
| | <i>Aethes languidana</i> (Mann, 1855) |
| | <i>Aethes bilbaensis</i> (Rössler, 1877) |
| | <i>Cochylidia heydeniana</i> (Herrich-Schäffer, 1851) |
| | <i>Neocochylis molliculana</i> (Zeller, 1847) |
| | <i>Oxypteron schawerdai</i> (Rebel, 1936) |
| | <i>Cnephasia sedana</i> (Constant, 1884) |
| | <i>Platynota stultana</i> (Walsingham, 1884) |
| | <i>Avaria hyerana</i> (Millière, 1858) |
| | <i>Lozotaeniodes cupressana</i> (Duponchel, 1836) |
| | <i>Bactra venosana</i> (Zeller, 1847) |
| | <i>Bactra bacrana</i> (Kennel, 1901) |
| | <i>Bactra simpliciana</i> Chrétien, 1915 |
| | <i>Endothenia oblongana</i> (Haworth, 1811) |
| | <i>Endothenia marginana</i> (Haworth, 1811) |
| | <i>Endothenia pauperkulana</i> (Staudinger, 1859) |
| | <i>Lobesia botrana</i> (Denis & Schiffermüller, 1775) |
| | <i>Lobesia indusiana</i> (Zeller, 1847) |
| | <i>Lobesia limoniana</i> (Millière, 1860) |
| | <i>Thiodia couleruana</i> (Duponchel, 1835) |
| | <i>Acroclita subsequana</i> (Herrich-Schäffer, 1851) |
| | <i>Zeiraphera griseana</i> (Hübner, 1799) |
| | <i>Eucosma cumulana</i> (Guenée, 1845) |
| | <i>Gypsonoma minutana</i> (Hübner, 1799) |
| | <i>Grapholita molesta</i> (Busck in Quaintance & Wood, 1916) |
| | <i>Cydia adenocarpi</i> (Ragonot, 1875) |
| | <i>Selania resedana</i> (Obratzov, 1959) |

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| | <i>Selania capparidana</i> (Zeller, 1847) |
| Oro-, Supra- and Mesomediterranean | <i>Cochylimorpha meridiana</i> (Staudinger, 1859) |
| | <i>Eugnosta lathoniana</i> (Hübner, 1800) |
| | <i>Cnephasia alfacarana</i> Razowski, 1958 |
| | <i>Cydia ulicetana</i> (Haworth, 1811) |
| | <i>Pammene fasciana</i> (Linnaeus, 1761) |
| Meso- and Thermomediterranean | <i>Phtheochroa syrtana</i> Ragonot, 1888 |
| | <i>Cochylimorpha decolorella</i> (Zeller, 1839) |
| | <i>Cochylimorpha straminea</i> (Haworth, 1811) |
| | <i>Aethes margarotana</i> (Duponchel, 1836) |
| | <i>Aethes francillana</i> (Fabricius, 1794) |
| | <i>Acleris variegana</i> (Denis & Schiffermüller, 1775) |
| | <i>Clepsis eatoniana</i> (Ragonot, 1881) |
| | <i>Bactra lancealana</i> (Hübner, 1799) |
| | <i>Thiodia trochilana</i> (Frölich, 1828) |
| | <i>Epinotia thapsiana</i> (Zeller, 1847) |
| | <i>Epinotia dalmatana</i> (Rebel, 1891) |
| | <i>Crociosema plebejana</i> (Zeller, 1847) |
| | <i>Pelochrista infidana</i> (Hübner, 1824) |
| | <i>Eucosma gonzalezalvarezi</i> Agenjo, 1970 |
| | <i>Pseudococcyx tessulatana</i> (Staudinger, 1871) |
| | <i>Clavigesta gerti</i> Larsen, 2010 |
| | <i>Rhyacionia buoliana</i> (Denis & Schiffermüller, 1775) |
| | <i>Ancylis sparulana</i> (Staudinger, 1859) |
| | <i>Cydia ilipulana</i> (Walsingham, 1903) |
| | <i>Cydia vallesiaca</i> (Sauter, 1968) |
| | <i>Cydia pomonella</i> (Linnaeus, 1758) |
| | <i>Cydia amplana</i> (Hübner, 1799) |
| | <i>Selania leplastriana</i> (Curtis, 1831) |
| Oro- and Supra- and Thermomediterranean | <i>Phtheochroa ochrobasana</i> (Chrétien, 1915) |
| | <i>Tortrix viridana</i> Linnaeus, 1758 |
| | <i>Pelochrista mollitana</i> (Zeller, 1847) |
| | <i>Cydia coniferana</i> (Saxesen, 1840) |
| All areas | <i>Cochylimorpha cultana</i> (Lederer, 1855) |
| | <i>Phalonidia contractana</i> (Zeller, 1847) |
| | <i>Longicornutia epilana</i> (Duponchel, 1843) |
| | <i>Lozotaenia cupidinana</i> (Staudinger, 1859) |

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| <i>Cacoecimorpha pronubana</i> (Hübner, 1799) |
| <i>Clepsis unicolorana</i> (Duponchel, 1835) |
| <i>Clepsis siciliana</i> (Ragonot, 1894) |
| <i>Rhyacionia maritimana</i> Pröse, 1981 |
| <i>Cydia fagiglandana</i> (Zeller, 1841) |

Chorological analysis for the family Tortricidae in the Murcia Region showed that the species of wide distribution chorotypes are most abundant at 53.3% of the total, including the Eurasiatic (33.6%), Cosmopolitan (8.4%), Holarctic (7.5%) and Palaearctic (3.7%) chorotypes. On the other hand, the Mediterranean species are also abundant with 46.7%, distributed amongst the Atlanto-Mediterranean (20.6%), Asiatic-Mediterranean (19.6%) and endemism (6.5%) chorotypes. These last results differ from those obtained in the study of the Crambidae and Pyralidae families where the Mediterranean species were the most abundant with 56.6% (Garre et al. 2021) and 59.2% (Garre et al. 2022), respectively, which was consistent with the geographical position of the study area, while the species with wide distribution (53.3%) are the most common in the mountainous biotopes of the centre and north of the study area.

Regarding the biology of the species, the environmental conditions of the study area, which affect the availability of trophic resources for reproduction, suggest that most of the species are univoltins (49.5%) and bivoltins (41.1%), while a small proportion are polyvoltins (9.3%). The voltinism of some species is based on known data from central and northern European species, so the life cycles of species in warmer and drier regions in the south of the continent, as is the case in the Murcia Region, do not necessarily have the same characteristics. In this way, the flight period of many species may be earlier, more extended and even bi- and polyvoltinism may be more frequent due to the bioclimatic conditions of the Murcia Region.

In relation to the feeding strategies of caterpillars, 37.4% of the species are monophagous, 26.2% oligophagous, 17.8% polyphagous and the feeding behaviour for the remaining 18.7% is unknown. Approximately 20% of the listed species are opportunistic with great agricultural and forestry interest as they are considered pests of numerous cultivated and wild plants that dominate part of the Murcian territory. Amongst the species that feed on cultivated plants are *Lobesia botrana* and *Sparganothis pilleriana* feeding on vines; *Cnephasia pasiuana* on wheat; *Cacoecimorpha pronubana* on pomegranate and ornamental plants; *Crociosema plebejana* on corn and cotton plants; *Grapholita molesta*, *Cydia pomonella* and *Pandemis heparana* on fruit trees; *Cydia splendana*, *C. fagiglandana* and *Pammene fasciana* on walnut trees; *Selania leplastriana* on cabbage. Species feeding on forest and wild crops are *Rhyaciona buoliana* and *Tortrix viridana* which can cause damage to pine and oak forests, respectively. *Platynota stultana*, originally from Mexico and the United States, is the case of a recently introduced pest. Detected in Europe for the first time in Murcia in 2009 by the Plant Health Services of Murcia, it was later found in crops in Almeria, Alicante and Granada. It is a polyphagous species that feeds on a wide variety of plant species, such as vines, pomegranates, ornamental plants, stone and seed fruit trees, alfalfa, lettuce,

peppers, tomatoes, etc. (Hymenoptera 2011, Groenen and Baixeras 2013), being observed in our samplings with extraordinary abundance in lemon tree crops.

On the other hand, some species are expanding their distribution in the Iberian Peninsula, such as *Cochylimorpha salinarida*, described with specimens collected in the Province of Alicante (Groenen and Larsen 2003) and extending its distribution area to some inland salt marshes; *Bactra simpliciana*, referenced from the coast of Almeria (Gastón et al. 2018, Garre et al. 2022) and recorded in the coastal dune systems; the Iberian endemic *Eucosma gonzalezalvarezi*, known from the Provinces of Almeria, Granada, Huesca, Lerida, Madrid and Zaragoza (Šumpich 2011, Ylla et al. 2015, Cifuentes 2019); and *Selania capparidana*, recorded for the first time in Almeria (Clarke 2011), has been collected in an inland steppe habitat. Finally, the description of a new species, *Eucosma callei* Girdley, Garre, Rubio & Ortiz, 2025, known so far only in the Murcia Region.

Discussion

Prior to our investigation, the number of known Tortricidae moth species in the Murcia Region was 32. Our study increases this number to a total of 107, based on an examination of museum specimens, published records and sampled individuals, accounting for 20.3% of all of the Iberian species known. This study presents an updated checklist of current Tortricidae moth species with their distribution and biological information for the Murcia Region in the south-eastern Iberian Peninsula. This study serves as both a guide for collection in the poorly-sampled south-western European continent and a comprehensive reference list with the Tortricidae taxa and localities where conservation is an important priority for policy-makers, conservation planners and for the management of insect diversity in Spain. We encourage lepidopterists holding additional data on systematically collected tortricids to produce an updated dataset.

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